

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

1-6. (Canceled)

7. (Currently Amended) A method for preparing a synthetic gas from methane and an oxygen containing compound using an atmospheric pressure barrier discharge reaction, the method comprising:

filling a catalyst in a portion of a reactor with a catalyst so as to form a methane reforming catalyst portion in the reactor, wherein the reactor comprises having a quartz tube constituting a body of the reactor and serving as configured to provide a dielectric layer between inside and outside of the reactor at the same time, and;

heating the methane reforming catalyst layer with a heating member, wherein the heating member is heated to about 200-400 degrees C and is arranged proximal to the methane reforming catalyst portion;

mixing the methane and the oxygen containing compound when a temperature is maintained to be 200-400°C through the filling and then introducing to create a mixture and providing the mixture into the reactor via an inlet tube of the reactor;

applying, simultaneously with the mixing, a high voltage to an internal electrode of the reactor inside of the reactor and an external metal thin film electrode outside of the reactor having a metal thin film to generate plasma in the reactor-, thereby producing a synthetic gas from the mixture when the mixture reacts while passing through the plasma and the methane reforming catalyst portion; and

discharging the synthetic gas via an outlet of the reactor.

8. (Original) The method according to claim 7, wherein the oxygen containing compound is one selected from a group consisting of carbon dioxide, water and air.

9. (Previously Presented) The method according to claim 7, wherein the catalyst is a methane reforming catalyst and is one selected from a group consisting of nickel catalyst, noble metal catalyst, alkali metal catalyst and alkali earth metal catalyst.

10. (Previously Presented) The method according to claim 7, wherein the catalyst is nickel catalyst.

11. (Currently Amended) The method according to claim 7, wherein a temperature of the heating member is maintained to be about 200~400°C.

12. (Currently Amended) The method according to claim 7, wherein the mixture methane and the oxygen containing compound introduced in the mixing react while passing passes through a region in which the reaction chamber plasma only exists among an area in which the plasma is generated in the reactor in the applying, and complete completes the reaction while passing through a successive region the methane reforming catalyst portion in which the plasma and the catalyst are mixed.

13. (Previously Presented) The method according to claim 7, wherein the external electrode is made of a metal coated to be thin on the quartz tube with a thickness of 0.5 mm or less.

14. (Currently Amended) The method according to claim 7, wherein the method is carried out by using an apparatus for preparing a synthetic gas from methane and an oxygen containing compound using an atmospheric pressure barrier discharge reaction, the apparatus comprising:

an atmospheric pressure barrier discharge reactor comprising a quartz tube configured to provide a dielectric layer between inside and outside of the reactor;

an inlet tube mixing and introducing where the methane and the oxygen containing compound into a reactor are mixed and inputted to the reactor;

an internal electrode of the reactor;

an external electrode made of the reactor comprising a metal thin film of the reactor;

a quartz tube constituting a body of the reactor and serving as a dielectric;

a methane reforming catalyst layer portion of the reactor filled in the atmospheric pressure barrier discharge reactor having the quartz tube with catalyst so as to induce a catalyst catalytic reaction therein;

a heating member mounted to heat the catalyst layer only disposed proximal to the methane reforming catalyst portion so as to heat the methane reforming catalyst portion;

a power supply supplying currents to the internal and external electrodes to generate plasma; and

~~electric wires in which currents flow;~~

~~a current-grounded part; and~~

~~an outlet for discharging a product (synthetic gas) prepared as synthetic gas from the reactor, wherein the synthetic gas is produced by a reaction is completed into an exterior.~~

15. (Previously Presented) The method according to claim 9, wherein the catalyst is nickel catalyst.